COMPROMETIMENTO DA ALTA ADMINISTRAÇÃO COM RELAÇÃO ÀS MUDANÇAS CLIMÁTICAS

TOP MANAGEMENT SUPPORT TO CLIMATE CHANGE

COMPROMISO DE ALTA GERENCIA CON RESPECTO AL CAMBIO CLIMÁTICO

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Contextus
ISSNe 2178-9258
Organização: Comitê Científico Interinstitucional
Editor Científico: Marcelle Colares Oliveira
Avaliação : Double Blind Review pelo SEER/OJS
Revisão: Gramatical, normativa e de formatação
Recebido em 05/07/2011
Aceito em 21/04/2014
2ª versão aceita em 08/06/2014
3ª versão aceita em 03/08/2014

RESUMO
Este artigo tem como tema as atitudes organizacionais relacionadas às mudanças climáticas (*Corporate Climate Change*). Seu objetivo é identificar se há comprometimento da Alta Administração nas atitudes corporativas com respeito às mudanças climáticas, comparando os resultados dos grupos "Brazil" e "S&P 500 M-Z" contidos no banco de dados da ONG *Carbon Disclosure Project.* Como metodologia foi utilizada uma pesquisa descritiva baseada em análise de dados secundários. A coleta dos dados foi feita por meio de revisão bibliográfica e informações conseguidas no questionário formulado pela *Carbon Disclosure Project*. Observou-se que 62% das empresas brasileiras e 66% de corporações norte-americanas analisadas dizem possuir um corpo ou comitê executivo designado para lidar com as mudanças climáticas.
Palavras-chave: Mudanças Climáticas; Atitudes Organizacionais; Comprometimento da Alta Administração; Brasil; EUA.

ABSTRACT
The article theme is the Corporate Climate Change and aims to identify whether there is top management support to the companies' attitudes related to the climate change, with a comparison between two groups of enterprises, "Brazil" and "S&P 500 MZ", using the Carbon Disclosure Project database. It was used a methodology of a descriptive nature based on secondary data collection, which was done through literature review and the observation of the CDP's questionnaires. It was observed that 62% of the Brazilian companies and 66% of the American corporations analyzed stated that they have an executive body with overall responsibility for dealing with climate change.
Keywords: Climate Change; Organizational attitudes; Top Management Support; Brazil; USA.

RESUMEN
Este artículo tiene como tema las actitudes organizacionales relacionadas con el cambio climático (Corporate Climate Change). Su objetivo es identificar si existe el compromiso de la alta dirección con las actitudes empresariales hacia el cambio climático, por medio de una comparación de los resultados de los grupos de "Brasil" y "S & P 500 MZ" que figuran en la base de datos de la ONG *Carbon Disclosure Project*. Este es un estudio descriptivo basado en el análisis de datos secundarios. La recolección de datos se realizó por revisión de la literatura y informaciones obtenidas por medio de un cuestionario elaborado por la *Carbon Disclosure Project*. Se observó que el 62 % de las empresas de Brasil y el 66 % de las corporaciones Estadounidenses dicen que han hecho un comité ejecutivo designado para hacer frente al cambio climático.
Palabras-clave: Cambio Climático; Actitudes Organizacionales; Compromiso de la Alta Dirección; Brasil; EE.UU.

1 INTRODUCTION

The technological development has provided many benefits and facilities for the majority of the population. However, this scientific breakthrough, mainly promoted by large companies, has caused undesirable changes in the environment around the globe. The natural environment is in a critical situation; the pollution levels increase in an exponential curve and the resources are consumed as if they were infinite. Probably, there is an anthropogenic effect leading to the extinction of animal species (COURCHAMP et al., 2006; NICHOLS et al., 1998).

As published in the Jornal da Ciência, n. 2802, in July, 2005, researchers at the National Institute for Space Research in São José dos Campos (São Paulo - Brazil) concluded that Catherine was the first hurricane to hit the South Atlantic. There is also a second disturbance caused by changes in weather patterns, occurred in the last quarter of 2008, when large floods occurred in the Vale do Itajaí, Florianópolis and the North Coast, surpassing previous records. The volumes of rain were intensified and several cities have suffered from floods and landslides, causing loss of lives.

Lately, the environmental destruction and the huge difference in life's standard among people have become very evident, and these problems should not be underestimated. Some societies have collapsed in different forms and degrees; this demands a profound change in corporate and in citizen behavior (DIAMOND, 2005).

As a response to such problem, in 2013, the Unites States government has announced a list of actions planned to reduce pollution, it was an intention to organize its society and its economy for dealing with the outputs of climate change. So, President Barack Obama issued the Climate Action Plan and gave to the Environmental Protection Agency (EPA) the task to intensively work on the power

sector in order to reduce its carbon pollution standards. "The EPA is proposing emission guidelines for states to follow in developing plans to address greenhouse gas emissions from existing fossil fuel-fired electric generating units" (EPA, 2014, p.1).

In order to deal with this situation, on June 2, 2014, the EPA publicized this carbon pollution reduction plan; the governors and the city majors have already started to take action. The proposal encompasses a different set of standards in order to address properly the specific conditions of each one of the Federal States. The EPA's document was designed to construct and establish an affordable and reliable renewable energy system in the USA, protecting the environment with the pollution's reduction (EPA, 2014).

There was a decrease in the National State's power over the last decades, and even if it still plays a key role within capitalism, the government alone does not have the ability to act on a scale and speed that are necessary. The State needs the aid of other sectors of society; public actors must also rely on the commitment of companies and other institutions, as they have a major impact on the political, economic and social arena (BELLEN, 2005).

Thus, due the need to react to these environmental issues a new organizational behavior has emerged. It is a kind of company that acts responsively towards the society and the natural environment, including in its business issues much broader than the traditional economic and financial targets. The concept of sustainability, which is based on environmental, social and economic-financial, should be seen as a significant business opportunity to be positioned at the core of the company strategy (PORTER, 2007, p. 86).

However, even showing an innovative ideal, several companies are being classified as opportunistic when they begin to change their attitudes and procedures to become more sustainable. They are accused of being motivated only by advertising merits, and not by effective and lasting change. So the effective commitment of the company regarding such issues should include the discussion and support of its top management team (PORTER; KRAMER, 2006).

During the past years the sustainability concept has established itself as a managerial concept widely used around the globe. There are rankings of Corporate Social Responsibility (CSR) that offer considerable visibility and importance to this concept, making CSR

appears as a priority for top managers. However, some types of CSR approaches are dispersed throughout the company and they are disconnected from its businesses and its strategy. The main executives should utilize the same tools used to monitor their core business choices in order to choose opportunities for CSR. It should not be a choice taken apart from the firm's main strategy nor it should be charity. The comprehensive actions taken based on this concept throughout the economy would lead to new bases for innovation and for competitive advantage (PORTER; KRAMER, 2006, 2011).

Mowery, Nelson and Martin (2010) affirm that the last decade has presented the climate change as one of the most serious threats to mankind. They present a leading role for the government in order to overcome this difficult. It's needed specific public policies to promote the development of new technologies, the enhancement of existing ones and their widespread deployment. Nevertheless, the government alone has not the leverage and the speed needed to deal with this situation in a due time (BELLEN, 2005; PORTER; KRAMER, 2011).

Therefore, this paper seeks to clarify and expose some of the actions that corporations have taken to deal with the climate change. There are some researches about this subject done in the last decade. For example, the environmental dimension of the company's actions should be influenced and handled by its top management executives (HOFFMAN, 2006; PORTER; KRAMER, 2011); and some authors suggest that environmental strategies increase corporate competitiveness (MICHALISING; STINCHFIELD, 2010; HART; DOWELL, 2011; MAKOWER, 2011).

Thus, this study intends to contribute to the literature's gap regarding the existence of top management bodies or committees specifically assigned to handle the corporate actions towards the climate change. In order to better understand if the company's strategy is aligned with environmental issues, this article's objective is to verify whether the organizations analyzed have an officially expressed support addressed by its top management executives as having overall responsibility to deal with the climate change. Then, the objective is expanded in order to bring out some of the attitudes that organizations are taking in order to handle the climate change situation.

This research is possible because of the availability of information about corporate climate change at the *Carbon Disclosure Project* database. This non-governmental organization (NGO) owned

questionnaires answered by the world's largest corporations, about corporate attitudes related to climate change. The intention of this research is to compare the responses of companies groups "S&P 500 M-Z" and "Brazil", which appear on the website of this NGO.

The next chapter concerns a literature review about the concept of sustainable development from its beginning until the concept of the corporate environmental sustainability; followed by the section where the organization's attitudes related to climate change will be clarified. In the subsequent section it will be described the research methodology and the logic behind the categorization that was conducted. Then, there will be a discussion comparing the data with the literature. At the end, there will be final considerations about the results and about the corporate climate change approach taken by the corporations analyzed.

2 THEORETICAL REFERENCES

This section describes the theoretical issues that underlie this research. It starts addressing from a wider concept of sustainable development down to a more business specific approach to sustainability. So, the following sections are: sustainable development; environmental problems and climate change; corporate approach to deal with climate change; and organizational attitudes related to climate change. This last section is subdivided in nine organizational attitudes related to climate change and they are the categories of analyses: top management support; renewable energy sources; taking action on the supply chain; plans for pollutant emission reduction; risk management; individual incentive mechanisms; development of environmentally friendly products; the decision makers engagement; and communication of voluntary sustainable measures.

2.1 Sustainable development

The concept of sustainable development was firstly introduced in 1968 by the Club of Rome, which was the first gathering to discuss the environment among Nation States' leaders. In 1972, there was the first international conference of governments to discuss the limits of natural resources - the Stockholm Conference, which showed the economic growth on a collision course with the environmental preservation (CAVALCANTI, 1998).

The study about the risks of environmental degradation "Limits to Growth" concluded that if maintained the

levels of exploitation at the rate of the 70's, the current model of development of the modern globalized society would be reached in one hundred years, leading to a drastic reduction of world's population and industrial capacity (MEADOWS et al., 1972). Diamond (2005) points out that there is a limited damage to the ecosystems that they can withstand before their systemic collapse. If kept in natural conditions holding the industrial production levels of 1972, the society, as we know, will not go beyond the year 2072. The "Limits to Growth" forecasts remain valid after an analysis thirty years later, assuming that levels of natural exploration of recent decades are maintained; there is a significant probability of a global socioeconomic collapse in the twenty-first century (TURNER, 2008).

How an unlimited economic growth model, which leads to a highly aggressive pollution levels to the biomes can be resolved? To answer this dilemma The Brundtland Commission report promoted for the first time the concept of sustainable development, defining it as the development "that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987, p.15)

The sustainable development concept encompasses a range of different perspectives, Sachs (1994) presents five dimensions: social, economic, ecological, geographical and cultural. However, it's important to clarify that the environmental dimension of sustainability is the focus of the present article. Ecological sustainability happens when there is an increase in the capacity of ecosystems' usage in order to satisfy the human needs, while maintaining its deterioration to a minimum (SACHS, 1994). In short, the sustainable development concept, that includes the environmental sustainability, forces the company's leaders to think in a long-term perspective and to acknowledge their place within the biosphere (BELLEN, 2005).

The last global gathering among business and governmental leaders about this subject was held in June 2012 in Rio de Janeiro city, The United Nations Conference on Sustainable Development - RIO+20. It was another attempt to unify and align nation's leaders actions towards a more sustainable world. Leaders from all over the globe were once again together, twenty years after the first convention - RIO92, in order to reach a common plan to reduce pollution and greenhouse gases emissions, among another proposed actions to tackle social problems. They still could

not implement a multilateral plan in accordance with all the major economies demands, making the RIO+20's effort not so effective as it could be.

Among the various problems presented to organizations, this paper focuses only on the environmental dimension of sustainability, being able to delve into one aspect of sustainable development. Therefore, this article aims to verify whether the top management executives of the organizations analyzed have taken some specific actions towards the environment, considering the climate change process, which can be both a threat and a consequent opportunity for the businesses.

2.2 ENVIRONMENTAL PROBLEMS AND CLIMATE CHANGE

Globalization was the dominant theme at the end of the twentieth century, but in the turn of the third millennium, new themes start to become fundamental for business and governments. The environmental problems are on the top of their agenda, and although they have no easy solutions they are a challenge to be faced by all the countries. The climate change and the pollution cannot be taken as national phenomena; they have to be seen in a global perspective and handled with joint forces (MARCOVITCH, 2006).

Currently, the problems arising from changes in weather patterns remain serious throughout the world, including Brazil. China lost 10% of its forests - an area of 173 square kilometers, equivalent to two thirds of the State of Sao Paulo because of frost and snow. The Floods continue to plague Southeast Asia, and in the United States, after the forest fires, the snowstorms and tornadoes continue to make many victims (NOVAES, 2008). The problem does not arise specifically from a planet's warm up, but rather due to abrupt changes in patters and intensities of rain, snow, heat and wind (IPCC, 2014).

It is known that many factors influence the climate of our planet, for example, the Sun's activity, the Earth's position in the solar cycle, as well as dust, soot and air humidity in the atmosphere, allowing a greater or a lesser degree the sunlight's penetration. The tectonic layers and the position of the continents, apart of the ocean currents, are important influencers at regional level. However, despite all these implications, the greenhouse gases are key factors (JOUZEL, 2008).

During the Conference on Environment and Development of the United Nations (UN) that occurred in Rio de Janeiro in 1992, it was developed a document called United Nations

Framework Convention on Climate Change, the Kyoto Protocol is also an agreement originated from the Rio Convention (UNFCCC, 2009). The climate change system is one of the most complex and important international systems because it implies profound interrelationships between the economy and the global environment. A fundamental problem of the feasibility of this Protocol comes from the fact it has been approved within a very difficult and emergency negotiation (VIOLA, 2002).

The intent of this agreement is to achieve stabilization of atmospheric greenhouse gases at a level that would prevent anthropogenic interference in the climate system. The Kyoto Protocol determines legal duties for the reduction of four greenhouse gases (carbon dioxide, methane, nitrous oxide and sulfur hexafluoride) and two groups of gases (hydro fluorocarbons, per fluorocarbons) produced by the industrialized countries, as well as general duties for all member countries (UNFCCC, 2009). The protocol established a series of targets to reduce greenhouse gas emissions that enhance the greenhouse effect, especially CO2 (VIOLA, 2002).

Since the Rio 92 formal intergovernmental agencies have worked to deal with climate change. The original Kyoto Protocol expired at the end of 2012, taking the discussions at the Copenhagen meeting in 2009 and at the Cancun meeting in 2010. In Mexico 91 countries (about 80% of world emissions) have pledged to mitigate their emissions. If totally implemented it is expected to reduce the emissions levels in 2020 to about one-tenth below the emissions level that would have been instead. This level would not reach the Kyoto intention to return emissions to the year 2005 levels. It would be extremely difficult to attain the targets of stabilizing global warming at 2 or 1.5 degrees without an immediate and complete joint commitment in international agreements of all major industrialized nations. There are diplomats trying to raise the level of mitigations, yet five countries (U.S., Russia, New Zealand, Japan and Canada) that originally signed the Kyoto Protocol will not participate in its second commitment period. One of the greatest challenges is to align the international institution as the UNFCCC with the business community on mitigations. Whilst there are efforts to engage different actors, the practical measurement of the emissions impact has been difficult to be made and much of the scientific studies in this subject are solely descriptive (IPCC, 2014).

However, there are signs that lead to a change in the perspective by the U.S., the world's largest economy, which the denial to participate in Kyoto has produced series of negative consequences for the full implementation of the international treaties. On June 2, 2014, the Barack Obama administration have made a full commitment to reduce emissions from its power plants, it has been planned significant mitigation targets (EPA, 2014).

Therefore, this article intends to point out how companies are dealing with the changes, the opportunities and the obligations created since the Kyoto Protocol. This research also observes how organizations are turning problems into opportunities, for example, the issue of changing the energy matrix into a more economical and less polluting one. In order to do so, it was conducted data analysis, according to declarations regarding the climate change actions that the top management has taken.

2.3 CORPORATE APPROACH TO DEAL WITH SUSTAINABLE DEVELOPMENT

While theories about corporate strategy were developed and refined since the 60´s, the theoretical bases on environmental and social strategy are more recent. They have emerged in the late 80´s and especially in the 90´s with the advent of Sustainable Development and the increasing need to incorporate its principles in corporate management models. Therefore, some studies have demonstrated the positive relationship between the adoptions of pro-active environmental strategies and the increase in company competitiveness as a result of this practice (MARTINELLI, 1999; MICHALISING; STINCHFIELD, 2010; HART; DOWELL, 2011).

The international economic scene and its implications about the right characteristics of development have changed profoundly after the Thatcher and the Reagan administrations, helping to establish the environmental and social aspects of development into the business and institutional agendas (DUNNING, 2006, p.189-190):

> "Corporations, too, though still fairly focused on the traditional objectives of their value adding activities, are increasingly aware of their wider social responsibilities. The environment, an acceptable minimum standard of working conditions, more accountability and transparency (e.g. of their financial viability and employment practices), a growing recognition of the importance of honesty, trust, reciprocity and other forms of relationship capital for successful partnering, a judicious and responsible application of any monopoly power they may possess, and the absence of corporate malfeasance are all avenues that are requiring new and multi-stakeholder institutional structures. These may be either of a top-down regulatory or incentive nature (e.g. anti-corruption legislation, the Global Reporting Initiative of the United Nations) or of a bottom-up

> voluntary nature (e.g. codes of conduct, actions on the part of civil society) to be a critical component of the NPD (New Paradigm of Development)".

For Dunning (2006) the Old Paradigm of Development (OPD) expresses that the country's institutions are primarily evaluated according to the efficiency in which its markets operate and also due to the role of governments in facilitating or obstructing this process. On the other hand, in the New Paradigm of Development, the institutions perform an important role in defining the attitudes and the governance of the organizations (and its individual decision takers) that are responsible for the development. In the NPD, the social capital infrastructure and the institutions of a specific society are the determinants of development, according to some characteristics as the "entrepreneurship, human resource development, the extent and pattern of innovation, the ethical imperatives underpinning inter-firm alliances and multi-stakeholder initiatives, the system of property rights, and the content and effectiveness of corporate social responsibility" (DUNNING, 2006, p.197).

A precursor to the discussions about corporation's role in development was Stuart Hart (2005), he also addresses according to the principals of a new perspective for development. In the past, the Management studies have ignored the natural environment in its considerations, as the resource-based theory shows. So, building upon this gap, the Natural-Resource-Based View (NRBV) suggests that a firm competitive performance is associated with its environmental actions (Table 1). The NRBV concept is based in three interconnected strategies: product stewardship, pollution prevention and sustainable development. There have been also two major themes: the connections between the NRVB and the sustained competitive advantage; and the linkages among the three stated strategies (HART, 1995).

> "The next 40 years thus present an unprecedented challenge: either alter the nature of economic activity or risk irreversible damage to the planet's basic ecological systems. This portends nothing less than a "paradigm shift" for the field of strategic management because it appears that few, if any, of our past economic and organizational practices can be continued for long into the future; they are simply not environmentally sustainable" (HART, 1995, p.991).

Table 1 - A Natural-Resource-Based View; Conceptual Framework

Strategic Capability	Environmental Driving Force	Key Resource	Competitive Advantage
Pollution Prevention	Minimize emissions, effluents, & waste	Continuous improvement	Lower costs
Product Stewardship	Minimize life-cycle cost of products	Stakeholder integration	Preempt competitors
Sustainable Development	Minimize environmental burden of firm growth and development	Shared vision	Future position

Source: Hart (1995, p.992).

According to the NRBV organizational theorists and strategists have to embrace the environment resources and to understand the problems due its limitations in order to compel the firm's competitive advantage (Table 1). The Pollution Prevention may be achieved in two ways: a) control of the pollutants emissions and effluents; b) prevention in order to reduce or mitigate the emissions and the effluents, preventing through better processing, innovation and recycling. The Product Stewardship is related to how a firm can be driven towards minimizing the environmental damage caused by its products: a) leaving environmental harmful business; b) creating new products with lower life-cycle costs. The Sustainable Development strategy is promoted through a sense of social-environmental purpose, and it seems to imply consequences for companies: a) they owe to recognize the connection between the environmental degradation in the Southern Hemisphere and the material consumption in the Northern Hemisphere; b) firms must establish markets in the Southern Hemisphere in order to leverage its the economic activity, while reducing the environmental footprint of its economic activity (HART, 1995).

Hart and Dowell (2011) have made a review of the NRBV (Table 2) and they have separated the sustainable development into Clean Technology and Bottom of the Pyramid (BoP). The first one is related to the strategies that set up ways for firms to create new technologies, positions and competences in order to have competitive advantage as industries progress. The second term, widely promoted by Prahalad and Hart (2002), suggests that corporations should access unsatisfied markets (usually in the Southern Hemisphere) in order to provide them better living conditions, and at the same time, reaching the house of billions of people that live in the bottom of the socioeconomic pyramid.

> "As clean technology and BoP strategies continue to gather momentum in the world, the opportunities to advance management theory have never been greater. Each provides important pieces to the sustainable development puzzle: the

promise of "next generation" technologies with dramatically lower environmental impacts, and innovative new ways to reach and include all of humanity in the capitalist dream (HART; DOWELL, 2011, p.1476)".

Table 2 - The Natural-Resource-Based View (NRBV): Fifteen Years After

Strategic Capability	Societal Driving Force	Key Resource	Competitive Advantage	State of Research Development
Pollution prevention	Minimize emissions, effluents, and waste	Continuous improvement	Lower costs	Strong empirical evidence in favor of NRBV
Product stewardship	Lower product life cycle cost	Stakeholder integration	Reputation/ legitimacy	Growing area of research but much to be accomplished
Clean technology	Make quantum-leap improvement	Disruptive change	Future position	Little research to date
Base of the pyramid	Meet unmet needs of the poor	Embedded innovation	Long-term growth	Growing body of practitioner-oriented research, but academic attention needed

Source: Hart and Dowell (2011, p.1472).

In the same direction, Makower (2011) points out three types of green economy: a) the first based on innovative ventures to handle renewable energy, transportation, water use, new raw materials and new clean technologies; b) the second consists of small companies specialized in green daily products and services; c) the third and most important is the green economy related to important and global companies, the ones that are gradually aligning the green agenda to their strategy.

After the pioneer Hart (1995) the business agenda started to take seriously the environmental and social issues. For instance, Porter and Kramer (2011) that have been writing about strategy and government for the last decades are now into the social arena with their Creating Shared Value (CSV) concept. In this proposed corporate set up, the top management executives have to realign the entire purpose of the company in order to achieve full benefits from execution of the CSV. The corporation must expand its core business to a more social approach, it has to be understood by the top management which social and environmental issues are plausible to be tacked by the company, In this sense, just a few societal needs are going to be satisfied by one specific firm, and the managers have to know how to connect its core business with the community's demands (PORTER; KRAMER, 2011).

Porter and Kramer (2011) say that a company can practice the shared value with its community through three interconnected levels: a) identifying new needs, redesigning markets and providing new products to its customers; b) verifying

how productivity could be redefined in the company's value chain (supply chain); c) accessing and working in order to improve the conditions and the development of its local cluster (interrelated companies, customers, suppliers, education and governmental institutions).

It has been reached the time when consumers, employees and the young people are demanding for the corporations to assume responsibility and to take care of their surroundings (PORTER; KRAMER, 2011). The multinational companies should wear the lens of a inclusive capitalism, they should keep raising their competitiveness levels, but doing so attending the demand of the poorest, as well as serving their customers with ever more eco-efficient products (PRAHALAD; HART, 2002).

2.4 ORGANIZATIONAL ATTITUDES RELATED TO CLIMATE CHANGE

This section describes the meaning here taken for each one of the categories of analysis (organizational attitudes related to climate change); they were chosen based on the literature and according to the availability of answers at the CDP's questionnaires. The nine following topics are the organizational attitudes that companies have taken towards the climate change; they have been chosen to guide the comparisons between the Brazilian and the American corporations. The logic behind the categories will be explained in the Research Methodology section.

The first category is "top management support". It's aimed to point out if there's a body of the firms' top management specifically created to plan and to support the corporate attitudes related to climate change. According to Kotler (1975), strategic planning is a management methodology that allows taking the direction to be followed by the organization, seeking greater interaction with their surroundings. For Porter (2000) the role of the strategist is to influence on the industry structure in which the business operates, not simply accepts the rules imposed or even the configuration adopted. Currently, one of the main characteristics of large organizations is precisely to lead the changes in their activity and set the standards of conduct in the industry. Then, we can observe the importance of strategic leadership to be proactive in the company's relationship with environmental issues and not just react to the competitive environment.

The strategic vision is a clear perception of the common purpose of an organization and ways to achieve them. The vision must be shared by all those who are involved in your creative endeavor.

Therefore, the influence of strategic leadership is threefold: the first is to design the vision, the second is to communicate and inspire others on the vision, and the third is to influence the firm to follow the vision. But beyond the influence, strategic leaders have the intellectual task of providing substance to the vision in the form of common aspirations and strategic actions that pose to meet these aspirations (ANSOFF, 1988).

The second category is "renewable energy sources". The energy sources can be classified as primary or secondary, or as renewable or nonrenewable. Primary sources originate from natural processes and include oil, coal, natural gas, etc. Typically, the primary energy needs to be transformed into secondary energy to be used, for example, we have the electricity or gasoline. It is called the energy sector, the industry that transform primary sources into secondary sources, for example, refineries, distilleries, mills, power generation, and so on (JANNUZZI; SWISHER, 1997).

According to Jannuzzi and Swisher (1997), the energy sources classification in renewable or non-renewable resources can be contested. At first, no source can be considered completely inexhaustible. However, energy sources are considered renewable if their use by mankind does not cause a significant variation in their potential and their short term replacements are relatively certain. For example, solar energy is considered renewable but it is originated from nuclear fusion reactions, which in turn are irreversible. Energy systems with low-carbon sources such as biomass or solar energy can be cost prohibitive for the short-term, but may be important contributions to the climate problem (DUNN, 2002).

The third category is "taking action on the supply chain". Lambert and Cooper *apud* Assumpção (2003) observed the supply chain management under technical logic by dealing with the business processes administration and activity cycles. The structure for technological and organizational management promotes an analysis of the changes that take place at the enterprise's network, with the main function to create training to companies under innovation, especially when it is brought by another, in command in the path of transformation.

What is important is that organizations are able to include a new conception of development in their business, that goes beyond and reformulate the concept of survival. The company must survive concerned about its survival and the future generation’s survival. It requires new attitudes in the business that should be

shared throughout the supply chain, whose collection and control reach global dimensions (GLOBAL REPORTING INITIATIVE, 2009).

Companies that are tuned to reduce pollutants in your supply chain, typically exchange the raw materials purchased from suppliers with high potential for emissions from other inputs with lower potential (KOLK; PINKSE, 2005). Therefore, such initiatives should be perceived, understood and extended to other organizations making up the business production chain. When the entire supply chain necessary for the construction of a product is on a sustainable path, then this concept is finally applied in a holistic manner (GLOBRAL REPORTING INITIATIVE, 2009).

The fourth category is "plans for pollutant emission reduction". This issue is especially important because it directly affects human health, biodiversity, ecosystems, climate and economic development (DELAI; TAKAHASHI, 2007). Thus, the organizations responsible for nature and mankind health should develop a plan to reduce the emission of harmful gases, where the top for a behavior change is the planning and goals presentation to your staff. This power of change is a movement that is distinct from the opposite positions of organizations to a cooperative relationship, which is forcing the implementation of effective actions to stop the climate change (OKEREKE, 2007).

From a business perspective, the reduction of air emissions has impact on their costs by reducing waste and risks related to fines for breaches of environmental legislation. Beyond that, companies with serious air emissions may have their reputation and license to operate affected because of the awareness environmental increase of its customers and neighboring communities (DELAI; TAKAHASHI, 2007).

The fifth category is "risk management". Günter (2008) says the goal of risk management is to identify and value the types of risk, as well as the business dynamics that influence positively or negatively the organization development. Two trends are presenting the most recent basis for corporate activities on climate change. First, companies are facing the increase of external pressures, because of government regulations, public pressure, as well as NGOs pressure. On the other hand, the increase of regulations flexibility offers a broad scope of possible actions. Because of this, more and more companies are taking proactive actions to reduce emissions (OKEREKE, 2007).

Günter (2008) affirms that the risk related to the environment is classified as environmental risk. Organizations often match their environmental management with their risk management. The primary objective is to prevent costs from production accidents, consumer boycotts and environmental damage. A good risk management can be a source for competitive advantage in the long term, since it is integrated with business strategy. Including considerations of climate change in risk management, companies are establishing a basic requirement for taking actions related to climate. Therefore, many companies start with the focus on risk when they intend to take the environment friendly (HOFFMAN, 2006).

The sixth category is "individual incentive mechanisms". The researcher's reward system and the cost involved in the results' dissemination process determine whether that knowledge will be fully or partially revealed (used) or kept in secret (JORGE, 1999). Some countries have specific incentives to employed inventors, in the form of additional salary compensation, to motivate them to pursue high standards of productivity. The productivity of these inventors seems to be a major problem judging by the number of presentations on this subject at events and published articles in journals specialized in technology management, such as R&D Management, Research Policy, Research Technology Management etc. In Germany, since 1957, there is a specific statutory provision for employed inventors, giving them the right to receive adequate monetary compensation from their employers, beyond salary. The Japan patent law also provides a compensation determined by the profit that the employer obtains from the invention exploitation. In many countries there are specific statutes for higher education teachers and researchers in government laboratories. The aforementioned German law of 1957 establishes that the inventions made as a result of teaching activities belong to the teachers, even if they used resources of the employing institution (BARBIERI, 1999).

Beyond the laws, responsible companies are investing a bunch of resources in incentive to employees. This disbursement is required for the development of new environment technologies. These organizations work well because they believe that their survival in the long-term depends on it (KOLK; PINKSE, 2005).

The seventh category is "development of environmentally friendly products". According to Kotler (1996) a product is a thing or a service that can be acquired through a process of exchange,

also known as buying and selling. And technology can be defined as the technique associated with any changes in raw material, process or product. Thus, technological innovation will happen from the creation and development of new techniques, procedures and materials.

Because of the importance of new technologies for business success and the high risk associated with research and development, efforts to improve the innovation process are invaluable. So, remember that there are both successes and failures in these kind of business investments (MILITELLO, 1997). According to Brandalise (2006), special care is needed in the development of products and services that involves environmental issues, because the decisions related to new products are often complex and rely on scientific evidence, not always conclusive. There are also other reasons for organizations to choose 'cleaner' products, such as saving the value that would be spent to treat the waste and costs of bulky goods (CHURCHILL; PETER *APUD* BRANDALISE, 2006).

The eighth category is "the decision makers engagement". In this topic there is an emphasis on the influence of companies in public governance, decision-makers and politicians, on the issue of climate change and environmental problems. According to Rodrigues (2000), a strong and organized civil society is probably one of the most important prerequisites of democratic consolidation. More than any other constituent components of that government form, the civil society is that gives legitimacy to the authority of the state and democratic practices. Acting in an organized form, civil society plays an important role in preserving the democratic form of government, monitoring possible abuses and participating in the public policies formulation, mainly through interest groups.

These interest groups are basically the lobby. But it's not that lobby that pejoratively, in Brazil, is immediately associated with the influence trafficking, like the corruption, the use of bribery and abuse of economic power. On the contrary, any lobbying activity could not be more legitimate than that exercised by organized groups of civil society, the citizen ruling in favor of a common or public good cause (RODRIGUES, 2000). Recently, the engagement with decision makers has been an indicator of corporate behaviors related to climate change (JONES; LEVY, 2007). Thus, it's needed for truly sustainable companies that are engaged in representing civil society interests and its own input, pressing the creation or improvement of laws or the opportunities development for

the private sector can be mobilized in support of environment.

The ninth category is "communication of voluntary sustainable measures". Gray et al. (1995) argue that using voluntary forms of communication such as corporate social and environmental reports, companies are telling the public about their impact on the environment and their ecological activities. The act to report their responsible activities, including those related to ecosystem, is normally connected to improve the company's reputation (LANKOSKI, 2008). A widely known example of corporate sustainability reports is done by the Global Reporting Initiative (GRI), a NGO created in 1997 through a joint initiative between the NGO Coalition for Environmentally Responsible Economies (CERES) and United Nations Environment Program (UNEP). The GRI is headquartered in Amsterdam (Netherlands) and in 2002 it became independent and is currently an UNEP collaborator (GLOBAL REPORTING INITIATIVE, 2009).

3 METHODOLOGY

This research was based on secondary data collection, through literature review and information taken from the questionnaires available on the website of the NGO Carbon Disclosure Project (CDP). The mentioned analysis was conducted based on publicly displayed data provided by the CDP. This organization is not linked to any government or private company and is considered the largest and most reliable database concerning corporate climate change. The questionnaires are sent to corporations once a year and the intention is to gather information about their actions in relation to climate change. The UN General Secretary Ban Ki-moon said in the Carbon Disclosure Project 2009 Annual Report (CARBON DISCLOSURE PROJECT, 2009) that the CDP is effectively helping to convince businesses leaders to reduce their emissions of greenhouse gases.

The CDP was founded in the year 2000 and is an independent entity that openly provides information about climate changes issues related to the world's largest corporations activities. So, the CDP's survey tries to acquire data about the attitudes that these organizations take in order to protect themselves against threats (physical, regulatory and legal) and to take advantage from opportunities (development of environmentally friendly products) created by the climate change.

The present research focuses on the companies' responses that are available to the public, considering the 2008 Report (CDP6). It was used the data from two

groups in order to make a comparison, both groups of companies were selected because any of its homelands' governments were not signatory of the Kyoto treaty and they are also two major economies. The study aims to verify the answers of the companies listed in the Standard & Poor's 500 (S&P 500) with initial letters M to Z (U.S. companies) and the corporations of the group "Brazil", which consists of large corporations in Brazil. Both groups have members in the most diverse sectors of the economy, from trade to extractive industry.

The S&P 500 is constituted by a much larger number of companies than the Brazilian group; therefore, in order to make a more even comparison and in order to deal with less data, it was decided to subdivide the S&P 500 in the half, it was done through the first letter of the corporation's names (A to L and M to Z), and then it was taken randomly one of the two parts. Both S&P groups have companies of every industry, so the election of one half of the group did not compromise the results. It's important to notice that not every organization permitted their answers to be available for the public, remaining 115 companies in the "S&P 500 MZ" group and 26 corporations in the "Brazil" set.

Experts of the Carbon Disclosure Project developed the questionnaire that generated the responses; there are 67 questions in the survey, some require qualitative and others require quantitative answers from the companies. To check the measures taken by these two groups it was identified a list of corporate attitudes in which the responses are apparently explicit. The questionnaire used is the same in all cases, however, the quality and quantity of responses varied widely. In order to define the organizational attitudes that should be identified, it was decided by a combination of measures derived from the literature review, considering the relevance and the adherence to this article's objective, as stated in the introduction.

This method resulted in the choice of nine measures (attitudes related to corporate climate change) that were possible to be identified in all the companies analyzed, each one based on a specific question of the survey, as stated below. The following are all organizational attitudes related to climate change that were analyzed according to the questions:

a) Top management support: Question 4a - "Does a Board Committee or other executive body have overall responsibility for climate change?";
b) Renewable energy sources: Question 2hiii - "What percentage of energy costs are

incurred on energy from renewable sources?";

c) Taking action on the supply chain: Question 2cbiv - "Details in metric tonnes of CO2-e of GHG emissions in the company supply chain";
d) Plan to reduce pollutants' emissions: Question 3ai - "Does your company have a GHG emissions reduction plan in place?";
e) Risk management adjustment: Question 1aiv - "Has your company taken or planned action to manage the general and regulatory risks and/or adapt to the physical risks you have identified?";
f) Individual incentive mechanisms: Question 4b - "Do you assess or provide incentive mechanisms for individual management of climate change issues including attainment of GHG targets?";
g) Development of environmentally friendly products: Question 1biv - "Do you invest in, or have plans to invest in products and services that are designed to minimize or adapt to the effects of climate change?";
h) Engagement with decision takers and politicians: Question 4d - "Do you engage with policymakers on possible responses to climate change including taxation, regulation and carbon trading?";
i) Voluntary reporting of sustainable measures: Question 4ciii - "Details of your GHG emissions and plans to reduce emissions through voluntary communications such as Corporate Social Responsibility reporting".

So, these business activities (Table 3) were divided into five categories created to facilitate the understanding of the analysis and based on the article's objectives. The intention was to analyze their actions taken or the presence of elements that constitute the dimensions of analysis. It was checked the percentage of the firms in each group that were considered taking the attitude according to their answer. Thus, after the first analysis the results were compared between the two groups.

Table 3 - Analysis groups and their respective organizational attitudes created according the study's objectives.

Analysis Group	Organizational Attitude
Top management commitment	Top management commitment
Specific actions to reduce pollutants emissions	Renewable energy sources
	Taking action in the supply chain
	Plan to reduce pollutants' emissions
Organizational adaptation	Risk management adjustment
	Individual incentive mechanisms
Product development	Development of environmentally friendly products
Interaction, partnerships and communication of sustainable measures	Engagement with decision takers and politicians
	Voluntary reporting of sustainable measures

Source: Created by the authors.

The answers to the questions have been interpreted by the researchers and were considered only those clearly stated, meaning that the corporation has taken the attitude asked. It was developed a spreadsheet to tabulate the data, where the first column shows the company name and the first row contains the organizational attitudes chosen in this study. It was tabbed the number one at the interrelationship point "organization attitude" when the response was interpreted in a confirmative way (expressing action towards climate change). After checking all the questionnaires, these positive statements were summed and formed a total result (each one representing one company) for each of the nine proposed organizational actions. Then, it was developed a ratio between the total number of companies analyzed by the group and their respective number of hits per attitude, resulting in a rate for each group of organizational attitude.

It was used the same method to compare the proportion between the

organizational attitudes and the top management support. But, in this case, each group ("Brazil" and "S&P 500 MZ) was sub-divided into two sets, one that contains companies that have the support of its executive body and one that does not have the top executive team support concerning corporate climate change. The intention of this data crossing was to make a comparison between the percentages of organizations in the same group ("S&P 500 MZ" and "Brazil"), comparing the ones that have top management support and the ones that don't have. This analysis was performed to determine if the companies that rely on the support of its top executives also have a higher percentage of other actions taken related to climate change.

This study does not intend to generalize the results, but rather to consider only the positive responses of the organizations that left their answers available. Therefore, the results referred to the group "Brazil" or "S&P 500 MZ" only meant the responses of the corporations' data that were possible to be analyzed, the companies that left one or more of the analyzed questions unanswered were not computed. It's also worth noting that there's no intention to externalize the results saying that companies in general in Brazil and in the United States supposedly act in the same manner, but rather to show the analysis of the corporate groups focused ("Brazil" and "S&P 500 MZ"). This study considered all the questionnaires and only the ones publicly accessible during the month of August 2009.

For instance, it was not intended to establish a cause-effect relation when it was showed the companies that have top management's support and have also taken other actions related to climate change. The establishment of correlation between these variables must be the result of another future study. Instead, it was aimed with this interrelationship just to show a better visibility of the researches' objectives. All the development of this study was based on the accuracy of the information made by the respondents of these analyzed companies, and it's worth clarifying that there is no effective audit done by the CDP.

4 RESULTS ANALYSIS

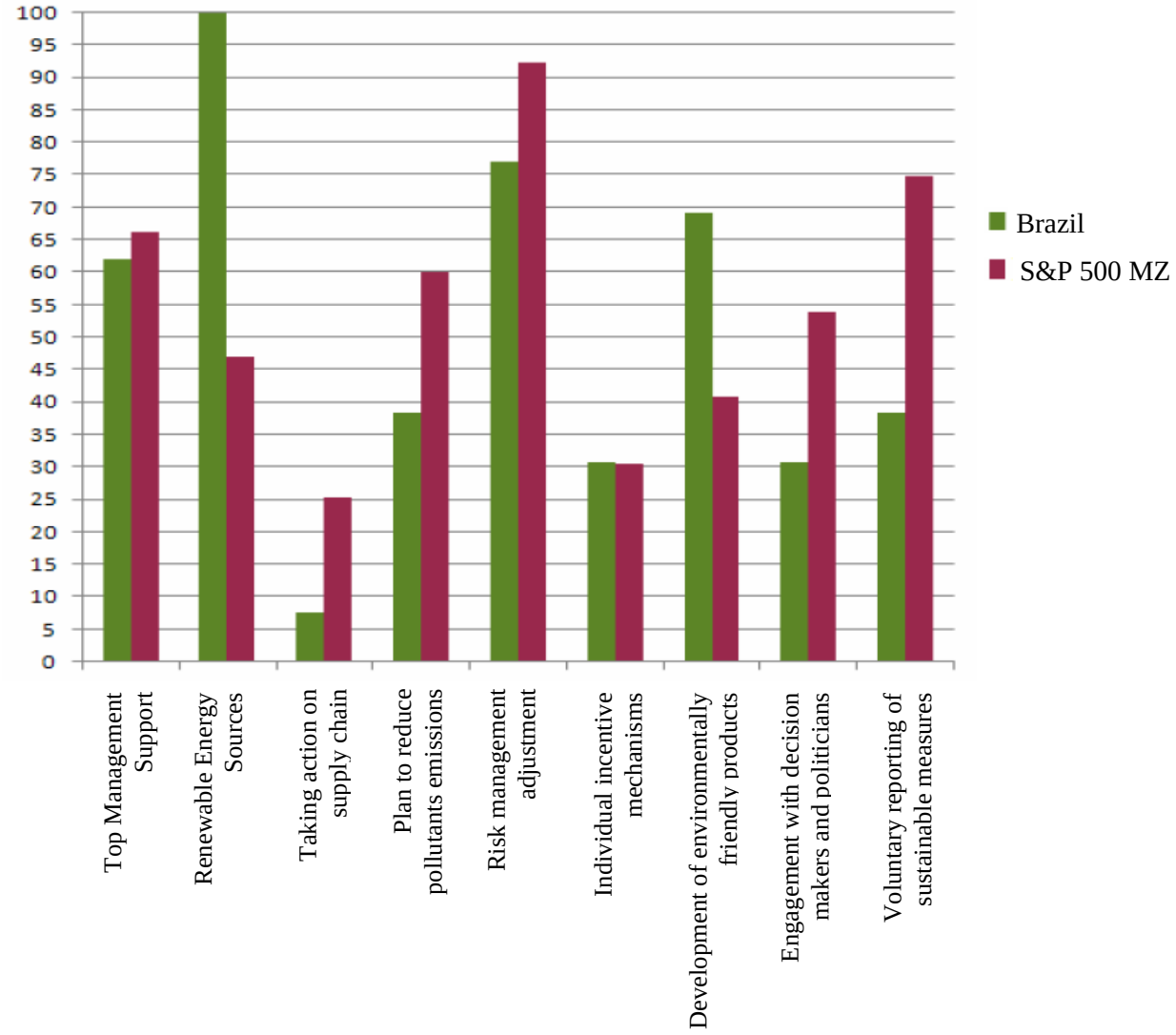
The intention of this topic is to present the research's results and compare it to the literature review. The Graph 1 shows a comparison of the groups "Brazil" and "S&P 500 MZ" among all the organizational attitudes related to climate change. It appears that only the attitudes "renewable energy sources" and

"development of environmentally friendly products" of the Brazilian companies showed a greater percentage than the "S&P 500 MZ" that responded positively to these organizational attitudes. According to Hart (1995), they might be earning competitive advantage due actions in accordance with the NRBV's strategic capabilities "Pollution Prevention" and "Product Stewardship" respectively.

In the attitude "top management support" there were proportionally more corporations of the S&P 500 MZ (66%) reported having a committee or executive body with special responsibility in dealing with climate change, while 62% of corporations in the group "Brazil" mentioned this action (Graph 1). It is important to emphasize the fact that when an organization's top management team is directly responsible for dealing with climate change, possibly many more areas and sectors receive the information and the resources to handle with the situation. When a strategic support does not exist, the process is disorganized and apparently without a deep commitment of the company as a whole (PORTER; KRAMER, 2011). This difference of 4% is relatively small, which shows that compared to these North American companies, the perception of the Brazilian corporations are slightly the same. That means the majority of both groups agree upon an entire corporate rearrangement in order to deal with the sustainable development, making them to corroborate with the Porter and Kramer (2011) proposal.

The high percentage (100%) in the attitude "renewable energy sources" may be related to the fact that the Brazilian energetic matrix is mainly composed of renewable energy sources. The proportion of 47% of the group "S&P 500 MZ" might be related to the fact that much of the U.S. energy is composed of non-renewable energy sources, such as oil and coal power plants (EPA, 2014).

Graph 1 - Comparison of all organizations attitudes between the groups "Brazil" and "S&P 500 MZ"



Source: Based on the research data.

The organizational attitude "taking action on supply chain" was mentioned in approximately 20% more companies from the S&P 500 MZ in relation to the Brazilian group. This higher percentage might be due a greater engagement of US corporations in monitoring its supply chain's emission. This emphasizes the importance of pollutant emissions' reduction during the all manufacturing process, from the extraction of raw materials to the final product. Porter and Kramer (20011) say that is important for a company to act upon its whole value chain in order to redefine its productivity, this action will increase the competitiveness of the corporation.

The attitude "plan to reduce pollutants emissions" presents approximately 20% more companies from the S&P 500 MZ than organizations of the "Brazil" group. For Hart and Dowell

(2011) the pollution prevention will lower company's costs and raise its competitive standards. Thus, a structured project with a measurable amount of reduction intended is fundamental for a firm committed with the climate change.

The attitude "Risk Management Adjustment" presented around 15% more companies in the group S&P 500 MZ than in Brazilian corporations, which are acting to minimize environmental risks. Recognizing the danger that climate change poses to the organization, it is also part of the start of activities in the direction of the attention of several corporate levels to this new reality. Therefore, it is important an analysis of the company's activities thinking towards the future. Assessing the regulatory risks, the risks due to fines for environmental damage and the possible loss of assets due to environmental disasters (HART, 1995).

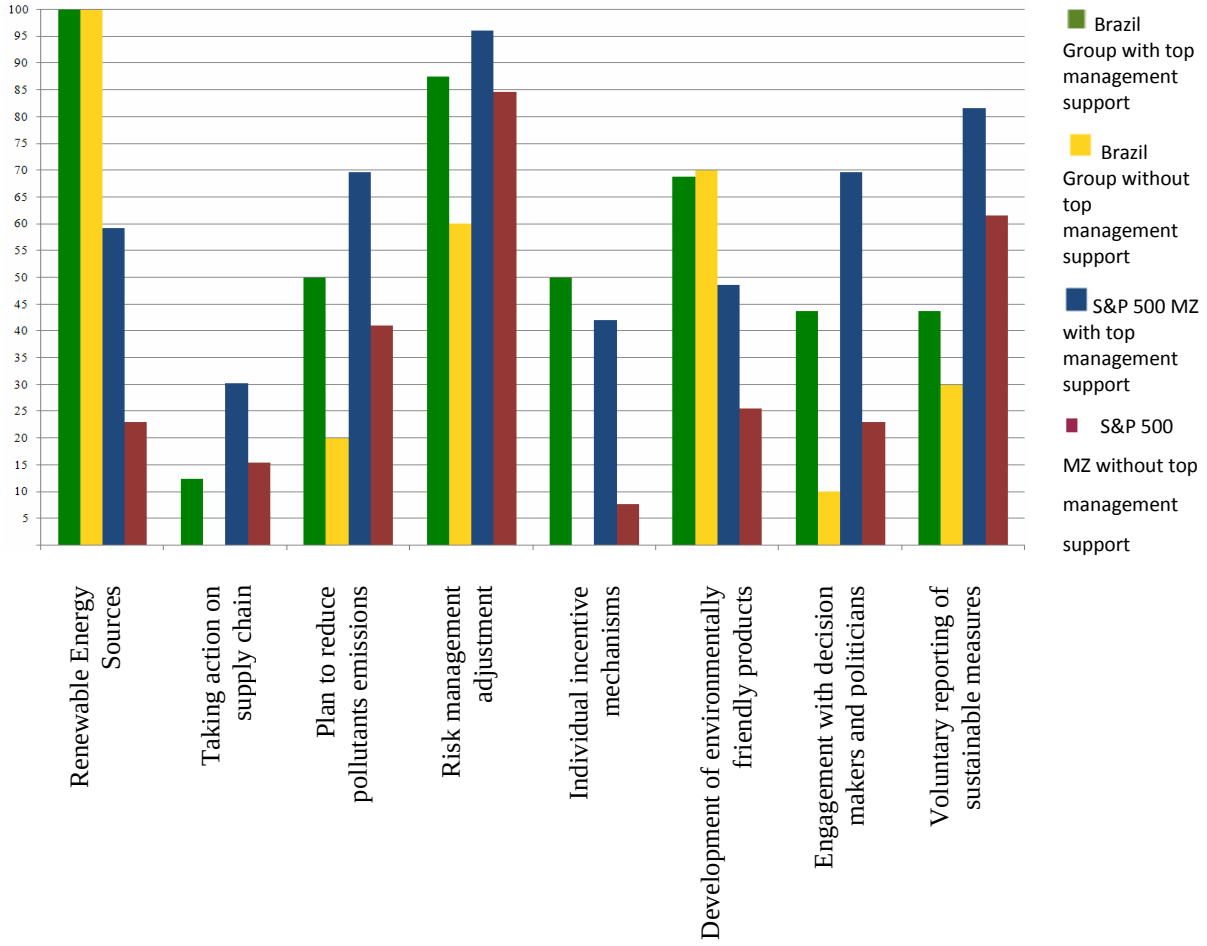
The attitude "individual incentive mechanisms" was present in both 30% of each group. The individual incentive is a way to effectively stimulate the employees to engage in new environmentally process or product development, turning company carbon footprint down. Makower (2011) states that global corporations must gradually realign their strategy with the green economy in order to gain competitive advantage. The offering of incentive mechanisms to the executives by the firm is clearly a highly motivation source for proactive action.

The organizational attitude "development of environmentally friendly products" was mentioned by 69% in the Brazilian group, against 41% of organizations of the group S&P 500 MZ. This percentage is relatively low in the case of U.S. firms, whereas the United States is widely known for its innovative and pioneer enterprises. The clean technologies present a new market niche for companies to perform ahead; these are the corporations that realize the possibility to earn profits by selling products or services with higher added value (HART; DOWELL, 2011; PORTER; KRAMER, 2011; MAKOWER, 2011).

The business action "engagement with decision makers and politicians" was mentioned by 25% U.S. corporations more than in the "Brazil" group. This might show that the corporations in the group S&P 500 MZ are actively intending to influence politicians and legislators to care about the climate change. Therefore, it is evident the importance of these global players, putting pressure on decision makers at the public level to improve the laws and requirements aiming to mitigate pollutant emissions. In this sense, Dunning (2006) suggests that multi-stakeholder

initiatives increase the effectiveness of corporate social responsibility, and Porter and Kramer (2011) say that a company can create shared value by developing and strengthening its cluster towards a better living conditions in the community.

Graph 2 - Comparison between all analysis' groups from the perspective of the top management support



Source: Based on the research data.

In the attitude "voluntary reporting of sustainable measures" 30% more of the U.S. corporations than the Brazilian ones confirmed this corporate action. The consumers' perception of how far the company is concerned and committed to solve the environmental problems is apparently pressuring the companies to perform better. For Hart (1995) these environmentally responsible corporations can gain competitive advantage for acting in a more responsible and transparent way, by publicly communicating its actions.

The Graph 2 shows an interrelationship between the attitude "top management support" to climate change with all the other eight attitudes. The green bars represent the percentage of companies in the group "Brazil" that have the commitment of its senior management, while the yellow columns represent the amount of the same group without the support from its main executives to deal with climate change. The blue columns show the percentage of organizations of the group "S&P 500 MZ" that rely on the support of its top management team, while the red columns show the proportionate amount of the same group, without a strategic support for dealing with the climate change.

In 100% of the corporation from the group "S&P 500 MZ" (Graph 2), considering all the organizational attitudes, have a senior management committed to climate change also showed a higher percentage of attitudes taken in comparison with the ones that didn't have top management support. It's expected that when a given the organizational strategy is created with responsibility for the climate; corporations also demonstrate a greater number of attitudes related to organizational change towards the same direction. Porter and Kramer (2011) affirm that in order to raise a company's performance and to create shared value, it's necessary from the top management a full commitment, as the entire strategy was to be tailored for this purpose.

However, in the case of "Brazil" group, among eight attitudes analyzed from the perspective of the "top management support", 75% of the companies that have a body or executive committee committed also showed a higher percentage than the same set of organizations that do not have an executive body committed to climate change. An exception is the variable "renewable energy source" that 100% of Brazilian companies reported the use of renewable energy sources to perform their activities. Another exception is the case of the "development of environmentally friendly products", where virtually the same percentage of companies both with and without a top management support develop environmental friendly products.

5 FINAL CONSIDERATIONS

It was intended to underline and bring out some of the attitudes that organizations are doing to deal with the climate change, and it was exposed whether the analyzed companies have an executive committee specially assigned to deal with the climate change. There is a clear need for the change in corporation

behavior, they have to manage in a more sustainable way. So, it was presented the literature about how this theme started to be scientifically discussed and how it has been evolving throughout the decades.

There has been much damage done to the natural ecosystem so far. However, the present moment offers a new paradigm for dealing with the sustainable development through the corporate perspective. Porter and Kramer (2011) say that usually the companies have been prepared to react to this situation as solely external threats, instead of taking it as an opportunity to raise competitiveness, guided by the company's core business.

The methodology was base on secondary data analysis from the Carbon Disclosure Project survey and through literature review. This study focused on the analysis of the companies that formed the groups "Brazil" and "S&P 500 MZ", the ones that left their responses publicly available on the CDP questionnaire of the year 2008.

This work was proposed for exposing some of the ways to handle this situation, comparing the responses of these two groups of organizations. The attitude "Top management support" was the main purpose of this article, which intention was to reveal if there's commitment from the senior management team regarding the organizational actions related to climate change. The results showed that 62% of companies in the "Brazil" group has stated the top management support, compared with 66% of "S&P 500 MZ". It was also carried out a comparison between the attitude "top management support" with all other corporate actions considered in this study. This interrelationship between variables showed that in 100% of U.S. corporations analyzed and 75% of corporations from "Brazil" group have a body or executive committee charged with handling climate change issues and also have a higher percentage of taking other actions towards the sustainable development.

It is important to notice that this study intended to point out and describe, not prescribe, some of the organizational attitudes related to climate change. Therefore, it doesn't aim to find a reason for the superior performance of one group, but to expose and analyze the results. The author emphasizes it is an opportune moment for such discussions and there is an increase in the corporate strategy literature that now embraces the sustainable development as a core demand for raising competitive advantage.

PUBLICATION

Abstract published in International Business in Tough Times, Academy of International Business in 2010.

REFERENCES

ANSOFF, Igor. **Administração Estratégica**. São Paulo: Atlas, 1988.

ASSUMPÇÃO, Maria Rita Pontes. Reflexão para Gestão Tecnológica em Cadeias de Suprimentos. **Gestão & Produção,** v. 10, n.3, dez. 2003.

BARBIERI, J. C. Os inventores no Brasil: tipos e modalidades de incentivos. **Revista de Administração de Empresas.** São Paulo, v. 39, n. 2, p. 54-63, abr./jun. 1999.

BELLEN, H. M. **Indicadores de Sustentabilidade**: Uma Análise Comparativa. 1ª ed. Rio de Janeiro: Fundação Getúlio Vargas, 2005.

BRANDALISE, Loreni Teresinha. **Modelo de suporte à gestão organizacional com base no comportamento do consumidor considerando sua percepção da variável ambiental nas etapas da análise do ciclo de vida do produto** 211f, 2006. Tese (Doutor em Engenharia de Produção) Pós-Graduação em Engenharia de Produção da Universidade Federal de Santa Catarina. Florianópolis, 2006

CAVALCANTI, Clóvis. **Desenvolvimento e natureza:** estudos para uma sociedade sustentável. -2ª ed.- São Paulo: Cortez; Recife, Fundação Joaquim Nabuco, 1998.

CARBON DISCLOSURE PROJECT. **Report 2008.** Available at <http://www.cdproject.net>. Access: 08/29/2009.

COURCHAMP, F et al. Rarity Value and Species Extinction: The Anthropogenic Allee Effect. **PLoS Biol.** 4(12), 2006.

DELAI, I.; TAKAHASHI, S. **Uma proposta de modelo de referência para mensuração da Sustentabilidade Corporativa.** Encontro nacional sobre gestão empresarial e meio ambiente. Curitiba, 2007. Available at: <http://engema.up.edu.br/arquivos/engema/pdf/PAP0255.pdf>. Access: 09/12/2009.

DIAMOND, J. **Colapso:** Como as sociedades escolhem o fracasso ou o sucesso. Rio de Janeiro: Record, 2005.

DUNN, S. **Down to Business on Climate Change: An Overview of Corporate Strategies.** In: GMI, v.39, p. 27-41 2002.

DUNNING, J. Towards a new paradigm of development: implications for the determinants of international business. **Transnational Corporations,** v. 15. n. 1, 2006.

ENVIRONMENTAL PROTECTION AGENCY (EPA). **Clean Power Plant Proposed Rule**, 2014. Available at: < http://www2.epa.gov/carbon-pollution-standards/clean-power-plan-proposed-rule>. Access: 03/06/2014.

GLOBAL REPORTING INITIATIVE. **Sustainability Reporting Guidelines**, 2009. Disponível em <http://www.globalreporting.org/>. Acessado em: 15 de setembro de 2009.

GRAY, R.; KOUHY, R.; LAVERS, S. **Corporate social and environmental reporting. A review of the literature and a longitudinal study of UK disclosure.** In: Accounting, Auditing & Accountability Journal, v. 8, n. 2, p. 47-77, 1995.

GRAYSON, D.; HODGES, A. **Compromisso social e gestão empresarial.** São Paulo: Publifolha, 2002.

GÜNTER, E. **Ökologieorientiertes Management**. Stuttgart: Lucius & Lucius Verlagsgesellschaft mbH, 2008.

HART, S. A Natural-Resource-Based View of the Firm. **Academy of Management Review**. Oct95, v. 20 Issue 4, p.986-1014. 29p, 1995.

HART, S; DOWELL, G. Invited Editorial: A Natural-Resource-Based View of the Firm: Fifteen Years After. **Journal of Management** 37(5): p.1464-1479, 2011.

HOFFMAN, A. J. **Environmental and Social Issues into Corporate Practice, Environment**, v.42, 2000.

HOFFMAN, A. J. **Getting Ahead of the Curve: Corporate Strategies That Address Climate Change**. Michigan, 2006. Available at: <http://www.pewclimate.org/docUploads/PEW_CorpStrategies.pdf>. Access: 09/10/2009.

INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (IPCC). **Climate Change 2014: Mitigation of Climate Change**, 2014. Avaliable at: <http://mitigation2014.org/ >. Access: 30/05/2014.

JONES, C. A.; LEVY, D. L. **North American Business Strategies Towards Climate Change.** In: European Management Journal. v. 25, n. 6, p.428–440, 2007.

JORGE, M. J. Doutrina de competitividade e política pública de P&D: evidências recentes e contribuições ao debate. **Revista de Administração Pública**, v. 32, n. 3, p. 135-58. mai./jun., 1998.

JOUZEL, J. **Le Monde Diplomatique**. Atlas der Globalisierung spezial – Klima. Die sehr lange Geschichte des Klimawandels. p.32-33. Berlin: Henke Rollenoffset, 2008.

KOLK, A.; PINKSE, J. **Business Responses to Climate Change: Identifying Emergent Strategies.** California Management Review, v. 47, n. 3, p. 6-20. 2005.

KOTLER, Philip. **Administração de Marketing**. São Paulo: Atlas, 1975.

KOTLER, Philip. **Administração de Marketing: análise, planejamento, implementação e controle.** São Paulo: Atlas, 1996.

LANKOSKI, L. 2008: **Corporate Responsibility Activities and Economic Performance: a Theory of Why and How They Are Connected.** In: Business Strategy and the Environment, v. 17, p. 536–547.

MAKOWER, J. A urgência da inovação. **HSM Management.** Setembro/ Outubro, 2011.

MARCOVITCH, Jacques. **Para mudar o futuro: mudanças climáticas, políticas públicas e estratégias empresariais**. São Paulo: EdUSP, 2006.

MARTINELLI, Dante Pinheiro. **Buscando competitividade através de estratégias ambientais.** ANAIS do Simpósio de Administração da Produção, Logística e Operações Industriais, 2, 1999.

MEADOWS, D. H.; RANDERS, J.; BEHRENS, W.W. **Limits to Growth**. New York, 1972.

MICHALISIN, M.; STINCHFIELD, B. Climate Change Strategies and Firm Performance: An Empirical Investigation of the Natural Resource-Based View of the Firm. **Journal of Business Strategies**. v. 27, n.2, p.123-149. 17p. 2010.

MILITELLO, K. Pare de jogar dinheiro no lixo. **Informática Exame,** São Paulo, p. 38-48, jun. 1997.

MOWERY, D.; NELSON, R.; MARTIN, B. Technology policy and global warming:

Why new policy models are needed (or why putting new wine in old bottles won't work). **Research Policy** v. 39, p.1011–1023, 2010.

NICHOLS, J.D.; BOULINIER, T.; HINES J.E.; POLLOCK, K.H.; SAUER, J.R. Estimating rates of local species extinction, colonization, and turnover in animal communities. **Ecological Applications.** v. 8, p. 1213–1225, 1998.

NOVAES, W**. As Mudanças Climáticas.** 2008. Available at: <http://www.percepcaoderisco.sc.gov.br/?ver=artigo-completo&artigo=20>. Access: 10/10/2009.

OKEREKE, C. An Exploration of Motivations, Drivers and Barriers to Carbon Management: The UK FTSE 100. In: **European Management Journal**. v. 25, n. 6, p. 475–486, 2007.

ORGANIZAÇÃO DAS NAÇÕES UNIDAS. Available at: <http://www.un.org/english>. Acess: 20/11/2007.

PORTER, M. **Guia Exame de Sustentabilidade**. "Param de Gastar Tanto Dinheiro". Ed. Abril, p. 86-89, 2007.

PORTER, M. **Revista HSM Management**. "A Nova Era da Estratégia". Ed.Especial, p.17- 28, 2000.

PORTER, M. E.; KRAMER, M. Strategy and society: the link between competitive advantage and corporate social responsibility. **Harvard Business Review,** v.84, n. 12, p.78-92, 2006.

PORTER, M. E.; KRAMER M. The Big Idea: Creating Shared Value. **Harvard Business Review,** v. 89, n.1-2, Jan./Feb., 2011.

PRAHALAD, C. K; HART, S. The fortune at the bottom of the pyramid. **Strategy+Business** v. 26, p. 54–67, Jan. 2002.

RODRIGUES, Ricardo J. P. **Desenvolvimento nas ações políticas da sociedade civil dentro e fora do congresso nacional.** Câmara dos Deputados. Brasília, 2000. Available at: <http://apache.camara.gov.br/portal/arquivos/Camara/internet/publicacoes/estnottec/pdf/006223.pdf>. Acess: 15/09/2009.

SACHS, I. **Desenvolvimento mundial**: uma idéia sobre desenvolvimento populacional. Toulouse, Revista Internacional dos Serviços Sociais, n. 141, Unesco/Erès, 1994.

SHRIVASTAVA, P. **Industrial/Environment Crises and Social Responsibility**, Journal of Socio-Economics, v.24, n.1, 1995.

STARIK, M; RANDS, G; **Weaving an Integrated WEB: Multilevel and Multisystem Perspectives.** Academy of Management Review. v.20, n.4, p. 908-935, 1995.

TURNER, G. **A Comparison of 'The Limits to Growth' with Thirty Years of Reality.** Commonwealth Scientific and Industrial Research Organisation, 2008.

UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE (UNFCCC). **Convention on Climate Change.** Available at: <http://unfccc.int/2860.php>. Access: 08/07/2009.

VIOLA, E. **O regime internacional de mudança climática e o Brasil**. Revista Brasileira de Ciências Sociais. v.17, n.50 out. 2002.